

MEGASENNIUS, A NEW GENUS FOR ACANTHOSCELIDES MURICATUS
(SHARP) (COLEOPTERA: BRUCHIDAE), A SEED PREDATOR OF
CASSIA GRANDIS L. (CAESALPINIACEAE) IN CENTRAL AMERICA

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ABSTRACT—*Megasennius* is described as a new genus for *Acanthoscelides muricatus* (Sharp), a Central American species probably related to *Sennius*. Both *Sennius* and *Megasennius* develop as larvae in seeds of *Cassia*, but *Megasennius* is restricted to *Cassia s. str.*, whereas *Sennius* larvae develop exclusively in other subgenera. Other bruchids restricted to *Cassia s. str.* are 2 species of *Pygiopachymerus* and 1 of *Zabrotes*. *Megasennius muricatus* is probably similar to these species in having a wide geographic range in tropical America, and its larvae probably attack seeds of all species of *Cassia s. str.* *Megasennius* and *Pygiopachymerus* are similar in 2 peculiar morphological features that distinguish them from their respective closest relatives. These features are probably related to special adaptations either for predation of seeds of *Cassia s. str.* or for emergence through the thick pod walls.

Johnson and Kingsolver (1973) stated that *Sennius* can be separated reliably from *Acanthoscelides* only by the hinge sclerites characteristic of the male genitalia. We recently discovered that a species heretofore placed in *Acanthoscelides* also has hinge sclerites, though of different form than in *Sennius*. *Acanthoscelides muricatus* (Sharp) is here placed in a monobasic new genus, *Megasennius*, distinguished from *Sennius* by the following characteristics: postocular lobe expanded and sharply delimited rather than short and inconspicuous; elytron strongly declivous basally and with striae 3-6 terminated by strong mucronations rather than nondeclivous and without strong mucronations; hind tibia with mucro much longer than coronal denticles rather than about as long as coronal denticles; and hinge sclerites of male genitalia oblique and crossed rather than arcuate and discrete. The larvae of *Sennius* and *Megasennius* develop in seeds of *Cassia*, but larvae of *Megasennius* are restricted to *Cassia s. str.* whereas those of *Sennius* are restricted to other subgenera. The terminology and general format for descriptions in this paper follow those of Johnson and Kingsolver.

Genus *Megasennius* Whitehead and Kingsolver, new genus

Type-species: *Bruchus muricatus* Sharp.

Description: Moderately large acanthoscelidine bruchids with the following characteristics (italicized when different from *Sennius*).

Head: With frontal carina blunt, alutaceous at base; antennae not sexually dimorphic, distal segments slightly eccentric, not serrate, *much shorter than hind femur*; in lateral view, venter of eye on same plane as ventral surface of labium; *postocular lobe elongated*.

Prothorax: With lateral carina present only as blunt posterolateral ridge; apex with short band of fine punctations; disc almost regularly convex, without asperities but with short median channel basally. Procoxae slightly separated at apices by vertical lamina of prosternum.

Elytra: With striae regular, not distorted laterally, well marked, *with prominent teeth at bases of striae 3-6; base strongly declivous*. Scutellum short, broad, bifid apically.

Hind femur: With ventral face flattened, mesoventral margin of face with single flattened subapical spine, lateroventral margin of face not carinate. Hind tibia with transverse apicolateral row of spinules (tibial corona), *micro much longer than coronal denticles*; lateroventral carina reduced to basal remnant.

Abdomen: With basal sternum unmodified; pygidium evenly convex, without asperities; apical margin of last sternum of male broadly emarginate to receive apex of pygidium, apical margin of last sternum of female without emargination. Male genitalia with lateral lobes *strongly bowed*, expanded mesally at apices, *divided to near base*; internal sac with hinge sclerites *oblique and crossed*, apical closure valve of ejaculatory duct circular, lateral diverticula present near closure valve.

Comparisons and relationships: Johnson and Kingsolver (1973) listed characteristics to separate *Sennius* from other New World genera of Bruchinae, and our comments regarding *Megasennius* are similar. The following genera differ from *Megasennius* by having more than 1 spine on the hind femur, by having the hind tibia strongly arcuate, or both: *Algarobius* Bridwell, *Caryedes* Hummel, *Ctenocolum* Kingsolver and Whitehead, *Gibbobruchus* Pic, *Meibomeus* Bridwell, *Mero-bruchus* Bridwell, *Mimosestes* Bridwell, *Pectinibruchus* Kingsolver, *Penthobruchus* Kingsolver, *Pseudopachymerina* Zacher, *Pygiopachymerus* Pic, *Rhipibruchus* Bridwell, and *Stylanthus* Bridwell.

The following New World genera have 1 spine on the hind femur but are distinguished from *Megasennius* by lack of hinge sclerites and these additional characteristics: *Cosmobruchus* Bridwell, *Dahlbruchus* Bridwell, and *Lithraeus* Bridwell by the lack of carinae on the hind tibia; *Bonaerius* Bridwell, *Cercidiestes* Bridwell, and *Stator* Bridwell by the definite lateral carina on the pronotum; and *Neltunius* Bridwell by the gibbous pronotum. *Abutiloneus* Bridwell and *Megacerus* Fahraeus have the spine of the hind femur either greatly reduced or absent. The cosmopolitan genera *Bruchus* Linnaeus and *Callos-*

bruchus Pic are distinguished from *Megasennius* by having an external spine on the hind femur.

Megasennius is distinguished from *Sennius* Bridwell, *Acanthoscelides* Schilsky, and the Old World genus *Bruchidius* Schilsky by having the following characteristics in combination: hind femur with single large spine (from some *Sennius* and *Bruchidius*, and from most Central and South American species of *Acanthoscelides*); elytron with strong teeth at bases of striae 3-6 (from all *Acanthoscelides* and *Sennius*, and from most *Bruchidius*); mucro of hind tibia long (from *Sennius* and most *Acanthoscelides*); and median lobe of male genitalia with hinge sclerites (from *Acanthoscelides* and *Bruchidius*; present but of different form in *Sennius*).

Certain large South American species have less elongate hinge sclerites than do the North American species treated by Johnson and Kingsolver (1973), but they probably belong to *Sennius*. None have the elytral, tibial, and genital characteristics of *Megasennius*.

Megasennius muricatus (Sharp), NEW COMBINATION

fig. 1-6

Bruchus muricatus Sharp 1885: 464; Pic 1913: 36. Type-locality: Bugaba, Panama. Type deposited in British Museum (Natural History), London.
Acanthoscelides muricatus: Blackwelder 1946: 760.

Description: Length (pronotum-elytra) 4.6-5.0 mm. Width 3.0-3.2 mm. Maximum thoracic depth slightly greater than length.

Integument: Basically rufous. Head and labrum dark, no postocular spot; antennal articles 1-5 testaceous, outer articles darker; prothorax dark rufous, coxa rufous, rest of leg rufotestaceous; pterothorax dark rufous; elytron rufous, humerus dark; middle leg rufous; hind leg dark rufous; abdominal sterna and pygidium dark rufous.

Vestiture: Uniformly yellowish, nearly uniformly distributed, moderately dense, recumbent; sparse on postocular lobe; small dense postocular patch; median line and small patch on each side of pronotal disc dense; nearly uniform on pygidium but most dense basally and narrowly along midline.

Head (fig. 4): Short and broad, densely punctulate; frons with median carina extended from frontoclypeal suture to vertex, flat, alutaceous, broadened basally; frons width about equal to width of eye; ocular sinus about $\frac{2}{3}$ as long as width of eye; postocular lobe elongated, swollen, strongly delimited by sulci; distance from base of antenna to apex of labrum about $\frac{1}{2}$ as long as distance from upper limit of eye to apex of labrum; antenna (fig. 1) with articles 1 and 3 filiform, 2 moniliform, 4 about as long as 3, 5-10 eccentric, 5 and 6 about as long as broad, 7-10 slightly transverse, 11 elongate and subacute; antenna not reaching base of pronotum.

Pronotum (fig. 3): With disc subcampanulate, slight depressions each side of middle, coarsely punctate; faint lateral carina from base $\frac{1}{2}$ way to coxal cavity; shallow median impression from basal lobe to basal $\frac{1}{3}$. Prosternum separating coxae except at apices.

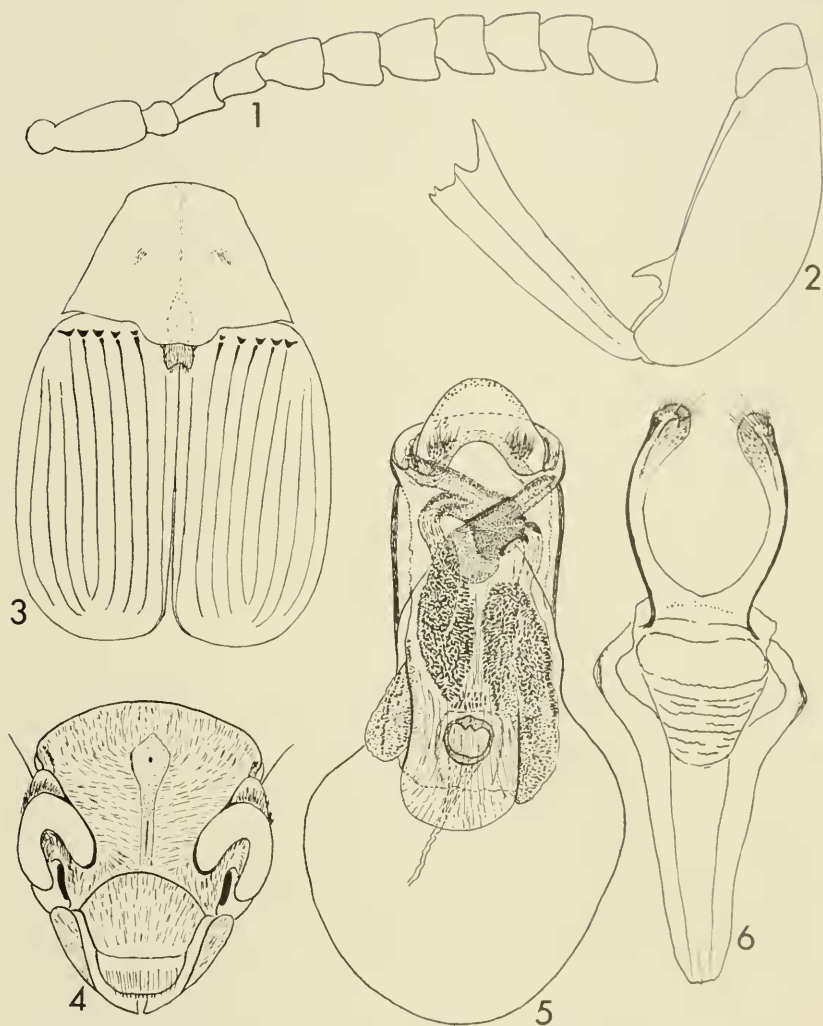


Fig. 1-6. *Megasemnius muricatus* (Sharp). 1, antenna. 2, hind femur and tibia. 3, pronotum and elytra. 4, head. 5, male genitalia, median lobe. 6, male genitalia, lateral lobes.

Pterothorax: With scutellum transverse, bidentate, with dense vestiture. Elytron (fig. 3) about $2\times$ as long as broad, dorsal surface evenly convex between humerus and medial margin; striae deep, finely punctate, striae 2-6 abruptly terminated before base by prominent mucronations, strial intervals finely punctulate; base strongly declivous in front of strial mucronations; distance between striae at base subequal; humerus punctulate, pubescent, intervals 8 and 9 finely

scabrous at humerus. Venter punctulate. Hind coxa punctate. Hind femur (fig. 2) clavate; ventral surface flat, with conspicuous inner carina, subapical acuminate spine about as long as width of tibial base. Hind tibia (fig. 2) with ventral, lateral, and dorsomesal glabrous longitudinal carinae, lateroventral carina faintly evident in basal $\frac{1}{2}$; tibial corona with 2 or 3 dorsal spinules, large lateral tooth, mucro about $2\times$ as long as lateral tooth and about $\frac{1}{4}$ as long as 1st tarsomere, sinus at base of mucro conspicuous; 1st tarsomere with ventral, lateral, and mesal glabrous longitudinal carinae.

Abdomen: With 1st sternum not flattened medially, about as long as remaining sterna, posterior margin straight; sterna 2-4 unmodified; sternum 5 emarginate in male, entire in female; pygidium punctate, convex in lateral view.

Male genitalia (fig. 5-6): Median lobe broad; in ventral view, ventral valve rounded apically, lateral margins convex, base not as broad as apex of median lobe, arcuate in lateral view; hinge sclerites large, complex, oblique, crossed; internal sac with dense microspicules in apical $\frac{2}{3}$ and extending into diverticula. Lateral lobes slender, bowed, cleft nearly to base, setose and mesally expanded at apices.

Material examined: Six specimens from El Salvador and Costa Rica, plus type and cotype from Panama. Origin unknown: intercepted 6-II-1971 in *Cassia* sp. at Laredo, Texas (4102:71-2032). EL SALVADOR. La Libertad: Quezaltepeque, 19-VI-1968, D. Q. Cavagnaro and M. E. Irwin. San Salvador: San Salvador, 5-VI-1958, O. L. Cartwright, and 9-VI-1958, L. J. Bottimer. COSTA RICA. Puntarenas: Puntarenas, 3-II-1970, reared from *Cassia grandis* L. by D. H. Janzen.

Discussion: *Megasennius muricatus* is known at present only from seeds of *Cassia grandis*, but it may be expected in seeds of related species. Kingsolver (1970a, b) and Janzen (1971) have published records of 2 other bruchid genera from various species of *Cassia s. str.* *Pygiopachymerus lineola* (Chevrolat) was reported from *C. fistula* L., *C. grandis* L., *C. javanica* L., and *C. moschata* H.B.K., El Salvador to Brazil; *P. theresae* Pic from *C. fistula* and *C. grandis*, Panama to Colombia; and *Zabrotes interstitialis* (Chevrolat) from *C. grandis* and *C. moschata*, Mexico to Brazil. *Megasennius muricatus* is probably similar to these species in host plant selection and in geographic distribution.

In the *North American Flora*, Britton and Rose (1930) recognized nearly 30 segregate genera within what is customarily treated as *Cassia*; for convenience, these segregates are here termed "subgenera," though they are not now formally recognized by most botanists. The bruchid fauna of *Cassia s. str.* is wholly different from those of the other "subgenera," most of which lack the woody seed pods characteristic of *C. grandis* and related species. One species of *Acanthoscelides*, several of *Amblycerus*, and all of *Sennius* are apparently obligate seed predators of 1 or more of these other subgenera, the bruchid faunas of which so far as known are only slightly distinct from one another. This basic dichotomy in host plant selection is stressed

for 2 reasons: it constitutes biological justification for distinguishing *Megasennius* from *Sennius*, and it indicates that systematic relationships of *Cassia s. str.* to other *Cassia* groups should be reexamined.

Megasennius and *Pygiopachymerus* are similar in 2 characteristics that set each of them apart from their respective closest relatives. In both, the postocular lobe is expanded and sharply delimited, whereas in *Sennius* and *Penthobruchus* the postocular lobe is short and inconspicuous. Also, both are characterized by having strongly developed teeth near the base of the elytron. The functional significance of these structures is unknown but probably has some connection either with development in seeds of *Cassia s. str.* or with the boring of the exit hole through the extraordinarily thick pod wall by the adult (Janzen, 1971).

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